1.

$$\frac{(a-b)\overbrace{(a+b)}^{8}}{\sqrt{a}-\sqrt{b}} = 48$$

$$\frac{a-b}{\sqrt{a}-\sqrt{b}} = 6$$

$$\frac{(\sqrt{a}-\sqrt{b}).(\sqrt{a}+\sqrt{b})}{(\sqrt{a}-\sqrt{b})} = 6$$

$$(\sqrt{a}+\sqrt{b})^2 = (6)^2$$

$$\underbrace{a+b}_{8} + 2\sqrt{a.b} = 36$$

$$2\sqrt{a.b} = 28$$

$$(\sqrt{a.b})^2 = (14)^2$$

$$a.b = 196 \text{ bulunur.}$$

Cevap: E

3.

$$\frac{\sqrt{a.b^2.b}}{\sqrt{b}} + \frac{\sqrt{a^2.b^2}}{\sqrt{a}} = \sqrt{b}$$

$$\frac{b\sqrt{a}.\sqrt{b}}{\sqrt{b}} + \frac{a.b}{\sqrt{a}} = \sqrt{b}$$

$$\frac{b\sqrt{a}}{1} + \frac{a.b}{\sqrt{a}} = \sqrt{b}$$

$$\frac{b.a + a.b}{\sqrt{a}} = \sqrt{b}$$

$$(2(a.b))^2 = (\sqrt{a.b})^2$$

$$4.a^2.b^2 = a.b$$

$$4.a.b = 1$$

$$a.b = \frac{1}{4} \text{ bulunur.}$$

Cevap: A

2.

$$(\sqrt{a}-\sqrt{b})^2 = (4\sqrt{3})^2$$

i) $\quad a + b - 2\sqrt{a.b} = 48$

ii) $\quad a + b + \sqrt{4a.b} = 24$

$\quad a + b + 2\sqrt{a.b} = 24$

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$$a + b - 2\sqrt{a.b} = 48$$
$$a + b + 2\sqrt{a.b} = 24$$
$$\overline{\quad 2(a + b) = 72 \quad}$$

$$a + b = 36 \text{ bulunur.}$$

Cevap: C

4.

$$(\sqrt{9^{x-2}})^2 = \left(\frac{5}{9}\right)^2$$

$$9^{x-2} = \frac{25}{81}$$

$$9^x.9^{-2} = \frac{25}{81}$$

$$\frac{9^x}{9^2 = 81} = \frac{25}{81} \quad \Rightarrow \quad (3^x)^2 = (5)^2$$

$$3^x = 5 \text{ olur.}$$

$$27^x = (3^x)^3 = (5)^3 = 125 \text{ bulunur.}$$

Cevap: E

5.
$$3^x = 9^y$$
$$3^{x+1} + 9^{y+1} = 972$$
$$\boxed{3^x}.3^1 + 9^y.9^1 = 972$$
$$9^y.3 + 9^y.9 = 972$$
$$12.9^y = 972$$
$$9^y = 81$$
$$9^y = 9^2 \implies y = 2$$
$$3^x = 9^2$$
$$3^x = 3^4$$
$$x = 4 \text{ olur.}$$

O halde $x.y = 4.2 = 8$ bulunur.

Cevap: D

7.
$$a - b = (\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b}) \qquad a = \sqrt{a}.\sqrt{a}$$
$$b = \sqrt{b}.\sqrt{b}$$

$$\frac{1}{(\sqrt{a}+\sqrt{b})} . \frac{(\sqrt{a} - \sqrt{b}).(\sqrt{a}+\sqrt{b})}{\sqrt{a}.\sqrt{a}.\sqrt{b} - \sqrt{b}.\sqrt{b}.\sqrt{a}} = \frac{1}{5}$$

$$\frac{(\sqrt{a} - \sqrt{b})}{\sqrt{a}.\sqrt{b}(\sqrt{a} - \sqrt{b})} = \frac{1}{5}$$

$$(\sqrt{a.b})^2 = (5)^2$$
$$a.b = 25 \text{ bulunur.}$$

Cevap: C

6. $$5^x.5 + \frac{5^x}{25} = 630$$

$$\frac{126.5^x}{25} = 630$$

$$126.5^x = 630.25$$

$$5^x = \frac{\overset{5}{\cancel{630}}.25}{\cancel{126}}$$

$$5^x = 125 = 5^3$$

$$x = 3 \text{ bulunur.}$$

Cevap: C

8.
$$a^2 - b^2 = (a - b)(a + b)$$

$$\frac{(3^x)^2 - (3^{-x})^2}{3^x + 3^{-x}} = -80.3^x$$

$$\frac{(3^x - 3^{-x})(3^x + 3^{-x})}{(3^x + 3^{-x})} = -80.3^x$$

$$3^x - 3^{-x} = -80.3^x$$

$$81.3^x = 3^{-x}$$

$$3^4.3^x = 3^{-x}$$

$$3^{x+4} = 3^{-x} \implies x + 4 = -x$$

$$2x = -4$$

$$x = -2 \text{ bulunur.}$$

Cevap: B

9. $7^x \cdot 7 = 35 \Rightarrow 7^x = 5$

$$\frac{(7^x)^2 + 15}{7^x + 5} = \frac{5^2 + 15}{5 + 5} = \frac{25 + 15}{10} = \frac{40}{10}$$

$$= 4 \text{ bulunur.}$$

Cevap: A

11. $\underset{(6)}{\frac{\sqrt{x}}{\sqrt{3}}} + \underset{(3)}{\frac{\sqrt{x}}{2\sqrt{3}}} + \underset{(2)}{\frac{\sqrt{x}}{3\sqrt{3}}} = \frac{11}{3}$

$$\frac{6\sqrt{x} + 3\sqrt{x} + 2\sqrt{x}}{6\sqrt{3}} = \frac{11}{3}$$

$$\frac{\cancel{11}\sqrt{x}}{\underset{2}{\cancel{6}}\sqrt{3}} = \frac{\cancel{11}}{\cancel{3}}$$

$$\frac{\sqrt{x}}{2\sqrt{3}} = 1$$

$$(\sqrt{x})^2 = (2\sqrt{3})^2$$

$$x = 12 \text{ bulunur.}$$

Cevap: D

10. $\dfrac{a - \sqrt{a}}{(a-1)^2} \cdot \dfrac{a + \sqrt{a}}{a} = 5$

$$\frac{(a^2 - a)}{(a-1)^2 \cdot a} = 5$$

$$\frac{\cancel{a} \cdot (a - 1)}{(a-1) \cdot (a-1) \cdot \cancel{a}} = 5$$

$$\frac{1}{a-1} = 5$$

$$a - 1 = \frac{1}{5} \Rightarrow a = \frac{1}{5} + 1$$

$$a = \frac{6}{5} \text{ bulunur.}$$

Cevap: C

12. $\dfrac{9^b}{3^a} = \dfrac{1}{3} \Rightarrow 3^a = 3 \cdot 9^b$

$$3 \cdot 9^b - 9^b = \frac{2}{81}$$

$$\cancel{2} \cdot 9^b = \frac{\cancel{2}}{81} \Rightarrow 9^b = 9^{-2}$$

$$b = -2 \text{ olur.}$$

$$3^a = 3 \cdot 9^{-2}$$
$$3^a = 3 \cdot 3^{-4}$$
$$3^a = 3^{-3}$$
$$a = -3$$

O halde $a \cdot b = (-3) \cdot (-2) = 6$ bulunur.

Cevap: E